**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT): \_Minnesota Dept of Transportation\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INSTRUCTIONS:**

*Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.*

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| **Transportation Pooled Fund Program Project #***(TPF-5(134)* | **Transportation Pooled Fund Program - Report Period:** Quarter 1 (January 1 – March 31)  Quarter 2 (April 1 – June 30) Quarter 3 (July 1 – September 30)XQuarter 4 (October 1 – December 31) |
| **Project Title:** Pavement Surface Characteristics Rehabilitation MnROAD Study. TPF 5-(134). |
| **Name of Project Manager(s):**Bernard Igbafen Izevbekhai, P.E., Ph.D. | **Phone Number: 651366 5454** | **E-Mail:** **Bernard.izevbekhai@state.mn.us** |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | **Project Start Date:** |
| **Original Project End Date: June 2013** | **Current Project End Date: October 2014** | **Number of Extensions: 1** |

Project schedule status:

x□ On schedule □ On revised schedule □ Ahead of schedule □ Behind schedule

Overall Project Statistics:

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|  **Total Project Budget** |  **Total Cost to Date for Project** |  **Percentage of Work**  **Completed to Date** |
| $315000 $275,000 for 5 years+$40,000 for Rolling Resistance | $315000 | 100% |

***Quarterly*** Project Statistics:

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|  **Total Project Expenses**  **and Percentage This Quarter** |  **Total Amount of Funds**  **Expended This Quarter** |  **Total Percentage of**  **Time Used to Date** |
| ≈100% | $70000 RR analysis (Transtec)$ 24000 DG Final report (MSU) | 100 % with extension |

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| **Project Description**:**OBJECTIVES**: To demonstrate and field-validate some lab-tested unique diamond grinding configurations that optimize noise, Friction, Texture and Ride Quality**PROJECT MANAGER**: Bernard Izevbekhai PhD**LEAD AGENCY**: MnDOTData Collection : MnDOT**PRINCIPAL INVESTIGATORs**: 1. **Data Collection** : MnDOT
2. **Data Analysis,**

W. James Wilde, PhD, P.E. MSU 1. **Rolling Resistance**

Jerzy Ejsmont DSc. Tech University of Gdansk, Poland(3) **Statistical Pass By** Tim Casey (HDR) Inc (4) **ROBOTIC Texture evaluation****Multivariate Analysis of ROBOTEX & Surface Variables** R.O. Rasmussen, PhD, P.E. Transtec IncR. Sohaney, P.E. (Transtec Inc)**PROJECT EXPENDITURES TO DATE**:Non-Federal Match. In-Kind Cost of Grinding And Noise Testing On Cell 37 MnRoad. As A Proof Of Concept.Full Width Grinding On Cells 7-8 MnRoad Mainline I-94MnDOT Initial Testing, MnDOT Rodeo (June 2008) Spring Noise Texture, Ride Friction MeasurementsConsultant Appointed For Data Analysis And ReportingStrategies For Additional TestingTesting And Monitoring of Cell 9 Draft Brief on Cell 9Construction Report 7 8 & 9.**Spring OBSI testing****Spring Ride Quality testing****Publication of Task 1 (Jim Wilde)****Completion of Draft Report on SPPB Tests on I-94 and MnROAD Cells****Completion of HDR SPPB /MnDOT OBSI Final Report.****Development of Rolling Resistance Initiative****Assistance with Technology Deployment: MnDOT Metro, MnDOT District 1 Duluth Projects****Summer OBSI, Ride Texture and Friction measurement****Fall OBSI, Ride Texture and Friction Measurement****Test Strip #5 Ground on Cell 37. Innovative with Improved friction.****Contract extended to accommodate Rolling Resistance testing****Contract documents initiated for comprehensive Robotex texture evaluation of diamond ground cells at MnROAD****Draft Final Report of Rolling Resistance in the Press****Draft final Robotex Report submitted****Extension of texture studies for RR multivariate analysis** |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**Final Report on Diamond grinding Study PostedFinal Report on Multivariate Analysis of RR and texture variables Posted**WORK COMPLETED:*** ACPA / IGGA performed the Grinding of 3 configurations at MnROAD Cell 37 for a proof –of –Concept and Preliminary On-Board -Sound –Intensity (OBSI) pre and post grind measurements on the 3 configurations + control. MnDOT performed Ride Friction, and Texture measurements on the same pre and post grind configurations.
* Memorandum of Understanding with Diamond Surface Incorporated to perform the Diamond Grinding Full width on cell 7 and 8 MnROAD.
* Measurements of Surface Characteristics parameters on the MnROAD Low volume Road
* Actual grinding of the Mainline cells 7 and 8 to the current and Innovative grinding configurations.
* Pre-grind Measurements for the MnROAD Mainline
* Grinding of Cells 7 and 8 full Width by Diamond Surfaces Inc.
* Initial Post Construction Ride texture friction Ride measurement by Mn/.DOT
* Draft Construction (Grinding Report for cells 7 and 8 Innovative Grinding & Conventional configurations)
* Development of Limited Scope of Consultant Activity for MnSCU Mankato
* MnDOT Initial Testing, MnDOT Rodeo (June 2008)
* Spring Testing Noise texture, Ride friction Measurements
* Consultant (Minnesota State University, Mankato) Appointed for Data Analysis and Reporting. Principal Investigator is W. James Wilde, PhD.
* MnROAD Cell 9 Ultimate Grinding Cell Created Ground and Tested.
* Spring Testing (Texture ASTM E-965, E-2157, Friction GN & FN, IRI, OBSI)
* Proposal to Conduct comprehensive evaluation (OBSI, CPB, SPB) on a Real Roadway. (Prescott WI or Monticello TH 94 MN) Estimated to Cost $62,000. ($20,000 Approved from by the Pooled Fund) Contract with HDR executed.
* OBSI and SPB in Progress near Hasty MN. The 1000-ft section is ground and east of that section an unground portion is being evaluated.
* Successful Web meeting on June 1 2009. Plans for a RODEO discussed but not yet done.
* Analysis of Friction Ride and OBSI over time Presented by W.J. Wilde
* Omnibus Cell 7 8 & 9 Report
* MnDOT Transtec Rodeo on Cells 37 7,8, 9 and others.
* OBSI and SPB in Progress near Hasty MN. The 1000-ft section is ground and east of that section an unground portion is being evaluated. Draft SPB Report Review.
* Summer 2009 Measurements
* Fall 2009 Measurements
* **Statistical Pass By Testing Completed.**
* **Draft report on Statistical Pass By Testing Completed.**
* **Spring testing by MnDOT OBSI Ride and texture.**
* **Final Statistical pass-by report Submitted for Publication**
* **Test Strip #5 ground on cell 37.**
* **Cell 71 ground innovative Driving and conventional passing**
* **Subcontract for Rolling Resistance measurements**
* **Rolling Resistance measurements on all MnROAD cells Performed in September**
* **Robotex Measurements performed on all MnROAD Cells**
* **Pooled fund meeting on 10/5/11**
* **Final Report of Rolling Resistance Report Published**
* **http://www.lrrb.org/media/reports/201207.pdf**
* **Final Report Completion Date extended to Oct 2013**
* Final Report on Diamond grinding Study Posted
* Final Report on Multivariate Analysis of RR and texture variables Posted
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| **Anticipated work next quarter**:* No Cost Extension Request to Rerun Rolling Resistance
* Contract Documents with MSU/ Tech University of Gdansk Poland

 Final Report: http://www.lrrb.org/media/reports/201429.pdf |

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| **Significant Results:****Report of Rolling Resistance Multivariate Analysis** **Quietness of Innovative Diamond Grind** |
| **Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated** **that might affect the completion of the project within the time, scope and fiscal constraints set forth in the** **agreement, along with recommended solutions to those problems).****To accomplish testing of Rolling resistance in 2014, Funds in the TPF were insufficient but MnDOT** **added $27000 to make up the $75000 to facilitate this testing. This was the final activity in this Pooled** **Fund Study.** |

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| **Potential Implementation:** Already Quiet grind is being implemented:. * MnDOT Duluth 50 million Dollar rehab project
* MnDOT TH 52 Rehab Project
* MnDOT Interstate 394
* Nationwide Acceptance and Usage
* Smooth Tire Friction Number of Innovative Grind is Equal or Higher than Ribbed Tire
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